ST80III/CMD   TABLE/TBL
BTA/CMD   FILECOPY/BAS
FTYPE/CMD   TERMCOM/BAS
CLOSE/CMD   NUMBER/BAS
ATB/CMD   TCONV/BAS
CKSUM/CMD   SUPERCOM/CMD
TERMII/CMD   CMPUSERV/TBL
UNIKYNEW/CMD   UNIKYNEW/SRC

U S E R ' S   M A N U A L

F O R

SBSG'S   COMMUNICATIONS PACKAGE FOR TRS-80* SYSTEMS

S T 8 0   III
============
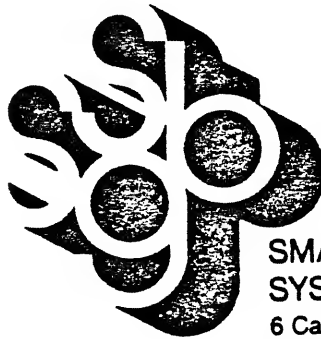
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Corp.

I.   INTRODUCTION TO SBSG'S ST80III COMMUNICATIONS SYSTEM

SBSG has provided that wonderful combination--you and your computer--with a new facility.   COMMUNICATIONS. Communications opens up a vast array of possibilities that can literally stretch right around the world.

The ST80III system lets you communicate text, data, programs, graphics or any other stored material. It handles both the outgoing material, and the acceptance and sorting out of incoming material. It allows you to tie into other computers and control them from your small Radio Shack system--no matter how much larger they are. It allows you to hold conversations, or to use the specialized data bases systems such as SOURCE or the Radio Shack 80's own FORUM systems.

With ST80III, you can join the communication networks--such as the MICRONET especially for microcomputer users, or the standard packet switching nets such as TELENET or TYMSHARE. Indeed, there are few limitations to what you CAN do.

This manual is to help you do it--to make the possibilities real.   That is its sole function, and together, hopefully, we will take your computer and connect it to whatever you want it connected with--even though we cannot know how much you already know about communications, or how much you want to study either them or the ST80III.

The arrangement of the manual uses three major subdivisions: Cook-Book, Tutorial, and Technical. The "COOK-BOOK" area has "How to Do It" communications recipes. The Tutorial area deals with specific aspects of communications, while the Technical area includes the technical descriptions of ST80III, and of a number of important supporting programs.

The reason for this design is because not everyone wants or needs to know all the complexities of communications that have been built into this system. Everyone wants a manual that will be EASY TO USE.   The difficulty lies in the fact that what one person finds simple, others find too complex, hence our COOK-BOOK, TUTORIAL & TECH approach to the design of the manual.

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USING THE MANUAL

With this three-part arrrangement there are many ways of using the manual. The COOK-BOOK, TUTORIAL & TECH parts can be used separately. For people who just want to know WHAT to do the task is often simple. The steps for actually performing a transmission, or a log-on are normally fewer than 12. To connect up to networks or timesharing systems takes at most less than two minutes, and involves--even in difficult cases-- under sixteen steps and greatly increases your systems usefulness. From a return-on-investment outlook, use of recipes to help you perform such tasks makes good sense.

COOKBOOK GIVES LEARNING BY DOING

Even if, in fact, you want to go further, it is worthwhile starting with this area and using the learning by doing approach that is implicit here. The notes in the Section will help you understand what is going on, and will give you a basis for later understanding of the various aspects, such as transmission methods, quality assurance, etc., even though these are not directly addressed in the Cook-Book Sections.

The Cook-Book area is broken down into two separate sections, II and III. Section II deals with computer-to-computer communications, which are the simplest items to start with. It includes delivery of programs and data files, etc. Section III gets into the wider world of networks.

LEARNING BY SUBJECT - TUTORIAL STYLE

Section IV contains another look at ST80 communications, this time broken down into subject areas and treated separately. This does have the disadvantage that it does not allow the newcomer to jump right in and achieve something, the way that the cook-books do. Still, a subject area only takes a few minutes to read up on (it is connecting it up with all the other matters that takes time and often causes confusion). Reading these, either to start with or as they become important, gives you a good background understanding.

This attack provides more material than you might expect, because communications, if they are to be successful, must be accurate in many, many areas. Even the processes of Quality Assurance provide a different outlook, and one that can be--and is--the subject of a separate tutorial in the middle part of this book.

LEARNING BY KNOWING - THE TECHNICAL WAY

The last part of the manual proper provides a third-manner of studying the system--the traditional study of the system itself. Sections V and VI go through the various types of dynamic, variable, and built-in controls that are included in the ST80III, as well as

introducing full lists of Keyboard and Non-Keyboard instructions used by the system.

These first six sections are followed by two sections which deal, respectively, with the specifications and performance of ST80III itself, and the various supporting programs used by the system for ease of maintenance and other matters.

Reviewing the different learning concepts used, you will see, perhaps, that they can make your world wider and simpler than you had expected; and use them to plan your approach to communications.

ST80III & COMMUNICATIONS BOTH NEED LEARNING

There are two areas that have to be studied-- communications possibilities, and how the ST80III program provides you with access to these possibilities, and makes them become real for you.

The major fact about communications is that you have to conform to both your own equipment (which may be restrictive) AND to the probably unknown and differing characteristics of each of the people and computers that you want to interconnect with.

Technically, this process is called interfacing and can be very complex.   Almost all systems use most of the American Standards Information Interchange (ASCII) codes for most of the work--but few if any are totally standard.

ST80III is designed with these complexities in mind, and provides--in the software--tables to be used to translate from one machine's style to another. These tables are brought into use both before the transmission starts, and to guide the operation while it is operating.

SUPPORTING PROGRAMS MAKE SYSTEM

Hopefully, you will find that in the manual, the ST80III and the supporting programs discussed are all that you need to make your wildest communication wishes come true. And with that, we suggest that you look at the next section and see how few steps are really necessary to connect your system to some exciting places that you may not have thought about as yet.

Please let us know about anything that is missing from the manual, or from the ST80III Communication System itself.   Some detail as to how and who it would help would be appreciated.   SBSG is always happy to receive letters or FORUM messages from the users of its products, as this is the way that good products are made better.

Good luck, and good communicating!

II. COOKBOOK COMPUTER/COMPUTER COMMUNICATION RECEIPES

Communications programs, if sophisticated enough, can provide many different types of work from the same keyboard. The two major groups are Terminal-type communications described in Section III, and Inter-computer communications described below.

Computer-to-computer communications is a much less common discipline than computer-to-terminal operations. Even professional data-processors do not work with such subjects every day. So most people will, at this stage, be first-time users of the computer/computer communications mode.

Actually, it is EASIER to see the full flow of action in the computer/computer case because your computer will, from time-to-time, be at both ends of the communication link. In the computer-terminal communication systems only ONE end is visible, which sometimes means that misleading impressions as to what is taking place may arise, in the same way that a listener to one side of a telephone conversation can be mislead.

Whether or not you actually want to use computer/computer communications, it is worth-while reviewing how SBSG's ST80III can be used between two computers that you DO have familiarity with--your 80 and another one just like it. This can be done, and you will soon be doing it using the following pages.

The methods of preparing the files, and the quality control features, are all laid out in the following tables of Computer-to-Computer Cook-book recipes.

However complex these tables look at first, with practice they will provide meaning, as well as guidance, so that it will soon cease to be a matter of trying to remember a particular sequence of switches and controls; but instead, as you go through the instructions, you will be visualizing what is physically going on throughout the communications process.

The underlying assumption in this section is that there are two ST80III users. As you develop your own expertise in using and modifying the systems, it may be that you will vary from this, and also start communicating with Apples and other computers from time-to-time. But one thing will be constant-- you will be in control and you will be personally performing tasks that few have previously had the opportunity to do!

CURRENTLY AVAILABLE RECEIPES

```
BASIC Program Delivery ............... Recipe II (A).
MACHINE Language Program Delivery.... Recipe II (B).
DATA File Delivery ...................Recipe II (C).
```

II. A.   Delivering a BASIC Language Program to another
ST80III

Opening Comment:

ALL TRS-80 users have Basic Language programs, and know which
programs they are, from the standard use of "/BAS" on the disk files
and in many other ways. This makes these programs some of the easiest
to work with for communications.

The recipe for transmitting such programs is shown now, and
really only uses 12 quick steps.

TABLE ONE

12 ACTIONS CAN TRANSMIT BASIC LANGUAGE PROGRAMS TO ANOTHER TRS-80

# : OUTPUTTING COMPUTER	: COLLECTING COMPUTER —
1 : Load BASIC Program	: No Action
2 : Save "PGM-NAME",A	: No Action
3 : Type CMD"S", then ST80III	: Type CMD "S",then ST80III
4 : Set Coupler to "O" or ORIGINATE	: Set Coupler to "A" or Answer
: Set Coupler to "F" (FULL DUPLEX)	: Set Coupler to "F" (FULL DUPLEX)
: Connect Power & Check Power On	: Connect Power & Check Power On
5 : Press SHIFT + UP ARROW + I	: Press Shift + UP ARROW + I
6 : On four questions, give 2,1,3,1	: On four questions, give 2,1,3,1
: Sets the output speed at 300 baud	: Sets the accepting speed at 300 baud
: and the word structure as being	: and the word structure as being
: 8-bit w/parity	: 8-bit w/parity
7 : Press G, SHIFT and UP-ARROW keys	: No Action
8 : On prompt AGAIN give file name as:	No Action
: in Step 2 above.	:
9 : On READY Press O,Shift & UP-ARROW:	On READY Press C, SHIFT & UP-ARROW

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VIDEOS

10 : At End Press E, SHIFT, & UP-ARROW:	At End Press X SHIFT, & UP-ARROW Then, Press F SHIFT, & UP-ARROW
11 : No Action	: On Prompt give New program name

12 : No Action   : At End Press E SHIFT
                                                       : & UP-ARROW

                              THAT'S ALL!

II.   COMPUTER/COMPUTER COMMUNICATIONS RECIPES

WHAT YOU DID--AND WILL HAVE LEARNED

The first action, loading and then saving the BASIC program with an ",A" after the name, will insure that the file is ready for communication in ASCII, as needed for communications. ASCII files can be used to store BASIC Programs, but so can Binary files. The ",A" is used to get the file ready.

THE MECHANICS OF A TRANSMISSION

The mechanics of a transmission are shown in Steps 4-9. The setting of the Full Duplex connection shows that the transmission is not entirely one-way. In fact, control signals are received from the receiving end before transmission starts. The need to have compatible understandings about word features, speeds, etc., is underlined in the identical responses called for on both ends in Step Six.

What is not obvious from this effort is the nature of the real relationship between Originate and Answer Modes, or the meanings of the various Alphabetic Commands used. Originate and Answer modes refer to the origination of the acoustical tone that carries the data--NOT to the question of who is transmitting the data. In fact, they are interchangeable. Next time, try interchanging the positions before transmitting.

In addition, you may have discovered that the RS 232 connector only plugs in one position and may sometimes need help. (Review Quality Assurance Tutorial No 2 if you had problems holding contact.)

THE ALPHABETIC COMMANDS OF ST80III

Within SBSG's ST80III you will have learned it has its own set of commands, which are given as needed from the keyboard by pressing THREE keys SIMULTANEOUSLY. Two of the keys, the SHIFT & UP-ARROW keys, are always pressed; the meaning of the command is given by the accompanying letter.

G, O, C, E and F Commands

In this case, five of the 26 available letters were used. In Step 7, the originating computer brought the file down into memory with the Command "G"; and in Step 9, set it up for Output with Command "O". At the same time, Command "C" set the Collecting computer ready to Collect or Accept the program once transmitted; and in Step 10, it was set to Save the received program from memory to the Disk with Command "F".

Finally, an organized exit from the routine was handled in Steps 10 and 12, taking both the users back into familiar ground under DOS.

The receiving computer can call the received program anything
it wants. If it came in from TOM, then it could be TOMSPROG/BAS.

COMMUNICATION FLEXIBILITY

The actions of answering the questions asked by the ST80III
in Step 6 will also have shown the power of the program to match
your current and future needs. For instance, you will have noted that
the speed that you were working with (300 bauds) was only a fraction
of the speed that can be used by the ST80III, that you were using a
one-byte 8-bit character for transmission and other items during Step
6. (For more details, review the tutorials.)

II. B. Delivering a MACHINE Language Program to Another ST80III.

Opening Comment:

ALL TRS-80 users have Machine Language programs, although they
may not realize that they have them. Instead, because of the ease of
their use of machine language programs under the operating system, the
user often thinks of the machine-language programs as being "Commands"
under an Operating System.

Some of the standard programs such as "FORMAT" or "COPY" can be
expected to be already present in the library of the computer you are
communicating with, but others will be special to you.   Delivering
them from one system to another can form an important communication
capability.

Machine language programs are actually treated exactly like
BASIC programs, but seem different as you have to use the unfamilar
file name--normally including the "/CMD" attribute-- which is not
needed when they are called in under DOS.

As a result, the recipe for transmitting such programs is very
similar to that given above for transmitting BASIC programs; and many
of the comments below are valid for BASIC Program delivery, as well as
to Machine program delivery. They are included both here and in the
prior Section and are not re-worded so that you can easily recognize
the repeated sections.

TABLE TWO

10 ACTIONS CAN TRANSMIT MACHINE LANGUAGE PROGRAMS TO ANOTHER TRS-80

# : OUTPUTTING COMPUTER	COLLECTING COMPUTER
	No Action
1 : In DOS type BTA PGM-NAME(IN) PGM-NAME(OUT)	
2 : Set Coupler to "O" or ORIGINATE Set Coupler to "F" (FULL DUPLEX)	Set Coupler to "A" or Answer Set Coupler to "F" (FULL DUPLEX)
Connect Power & Check Power On	Connect Power & Check Power On
3 : Type SHIFT + UP ARROW + I	Type Shift + UP ARROW + I
4 : On four questions, give 2,1,3,1 Sets the output speed at 300 baud and the word structure as being 8-bit w/parity	On four questions, give 2,1,3,1 Sets the accepting speed at 300 baud and the word structure as being 8-bit w/parity
5 : Press G, SHIFT and UP-ARROW keys	No action
6 : On prompt AGAIN give file name as in Step 2 above.	No action
7 : On READY Press O, Shift & UP-ARROW	On READY Press C, Shift & UP-ARROW

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8 : At End Press E, SHIFT, & UP-ARROW	At End Press X, SHIFT, & UP-ARROW Press F, Shift & UP-ARROW On Prompt give New program file name, including / ASC At End Press E SHIFT & UP-ARROW In DOS type ATB PGM-NAME ASC to PGM-NAME/CMD
9 : No Action	
10 : No Action	

WHAT YOU DID--AND WILL HAVE LEARNED

The first action, converting the Machine Language program from a file with the "/CMD" affix, and then saving it as an ASCII File, will have brought out the actual nature of the Machine Language programs as being files, like BASIC program files, but using the Command attribute, and being loaded and run from the operating system itself.

It will have also checked that the file is ready for communication in ASCII, as needed for communications. ASCII files can be used to store BASIC Programs, but so can Binary files. The BTA program is used to get the CMD program ready for transmission.

THE MECHANICS OF A TRANSMISSION

The mechanics of a transmission are shown in Steps 2-7. The setting of the Full Duplex connection shows that the transmission is not entirely one-way. In fact, control signals are received from the receiving end before transmission starts. The need to have compatible understandings about word features, speeds, etc., is underlined in the identical responses called for on both ends in Step Four.

What is not obvious from this effort is the nature of the real relationship between Originate and Answer Modes, or the meanings of the various Alphabetic Commands used. Originate and Answer modes refer to the origination of the acoustical tone that carries the data--NOT to the question as to who is transmitting the data. In fact, they are interchangeable. Next time, try interchanging the positions before transmitting.

In addition, you may have discovered that the RS232 connector only plugs in one position, and sometimes may need some help. (Review Quality Assurance Tutorial if you had problems holding contact.)

THE ALPHABETIC COMMANDS OF ST80III

Within the ST80III you will have learned it has its own set of commands which are given as needed from the keyboard by pressing THREE keys SIMULTANEOUSLY. Two of the keys, the SHIFT & UP-ARROW, are always pressed, and the meaning of the command is given by the accompanying letter.

G, O, C, E AND F COMMANDS

In this case, five of the 26 available letters were used. In Step 5, the originating computer brought the file down into memory with the Command "G", and in Step 7 set it up for Output with Command "O". At the same time, Command "C" set the Collecting computer ready to Collect or Accept the program once transmitted, and in Step 8, it was set to Save the received program from memory to the Disk with Command "F".

Finally, an organized exit from the routine was handled in steps 8 and 10 ("E") taking both users back into familiar ground under DOS.

The receiving computer can call the received program anything it wants; but, unlike BASIC programs, normally the same names are used for Machine Language programs as it is unlikely that there will be two commands that can be confused quite as often as there are more than one starwars game, etc. Generally then, this will be stored with the /CMD under the same name as originally used in the other computer.

COMMUNICATION FLEXIBILITY

The actions of answering the questions asked by ST80III in Step 4 will also have shown the power of the program to match into your current and future needs. For instance, you will have noted that the speed which you were working with (300 bauds) was only a fraction of the speed that can be used by ST80III, that you were using a one-byte 8-bit character for transmission, etc.

(For more details, review the tutorials.)

II.   C.   Delivering a Data File to Another ST80III

     Opening Comment:

          All TRS-80 users have Data Files of various types. The standard non-ASCII types are dealt with here, although you may start keeping a file in ASCII ready for transmission in the future.

          ASCII files can omit the first two steps of this receipe.

          Typically, data files are prepared by BASIC or machine language programs and then used by the same or related programs.   The user has no need to know just what the format of the files are, although this can vary. Files in standard format are of Type A (=ASCII) or type B (=BINARY), although only Type A files can be transmitted.   The first thing is to find out just what type of file is involved.   After this, the operations proceed much as the already described deliveries of BASIC and Machine Language programs.

                    TABLE THREE

16 STEPS CAN TRANSMIT BINARY OR ASCII DATA FILES TO ANOTHER TRS-80

# : OUTPUTTING COMPUTER	COLLECTING COMPUTER
1 : Give Command FTYPE on DOS READY	No Action
2 : Give Data File Name on Prompt	No Action
3 : If Response 'ASCII' Jump to #6	No Action
4 : Give Command 'BTA' on DOS READY (File type will have been noted Binary in Step 3.)	No Action
5 : Give Data File Name on Prompt	No Action
6 : Give Command ST80III on DOS READY	Give Command ST80III on DOS READY
7 : Set Coupler to "O" or ORIGINATE	Set Coupler to "A" or Answer
Set Coupler to "F" (FULL DUPLEX)	Set Coupler to "F" (FULL DUPLEX)
Connect Power & Check Power On	Connect Power & Check Power On
8 : Type SHIFT + UP ARROW + I	Type SHIFT + UP ARROW + I
9 : On four questions, give 2,1,3,1	On four questions, give 2,1,3,1
Sets the output speed at 300 baud and the word structure as being 8-bit w/parity	Sets the accepting speed at 300 baud and the word structure as being 8-bit w/parity
10 : Press G, SHIFT and UP-ARROW keys	No Action
11 : On Prompt AGAIN give file name	No Action
12 : On READY Press O, SHIFT & UP-ARROW	On READY Press C, SHIFT & UP-ARROW

TRANSMISSION   OCCURS & BLINKING LIGHTS SHOW ON TOP CENTER OF BOTH

VIDEOS

13 : At End Press E, SHIFT, & UP-ARROW   At End Press X
                                              SHIFT, & UP-ARROW
                                              Type F, SHIFT & UP-ARROW
                                              On Prompt give New File Name
14 : No Action   At End Press E, SHIFT
15 : No Action   & UP-ARROW
                                              If original file was
16 : No Action   in Binary
                                              (See Step 4 above)
                                              give ATB DOS READY
                                              & file name on prompt

THAT'S ALL!

WHAT YOU DID--AND WILL HAVE LEARNED

Some technical items not relating to ST80III or even communications will have been learned during this simple 16 step transmission.

BINARY & ASCII CODING CAN CO-EXIST

First, in Steps 1 through 5, there is a test of the file type, and a translation of the file type unless it was originally ASCII. This indicates that there are two file types, ASCII and Binary, but that only one type is usable. The FTYPE program identifies which type your data file is in and, if necessary, the BTA converts the binary files to ASCII for information interchange.

If a change is needed in the first place, so that transmission can take place, then after the transmission it will be necessary to convert back from ASCII to Binary. This is done in Step 16.

SAME TRANSMISSION METHODS

Otherwise, the same communication flexibility and transmission methods have been used as previously discussed. Even the same alphabetic commands--G, O, etc., are the ones that you will have met with in the BASIC and Machine Language program transfer. This underlines the essential central similarity between all transfers--that they are all just data transfers, and the rest of the procedure is simply to keep them in usable form. Naturally, therefore, the same comments apply here as have been given above in II (A) and II (B).

III. GENERAL & NETWORK RECEIPES

The world outside your computer is enormous, and is growing every day. Whole libraries, world-spanning satellite communications, and some of the biggest computational systems in the world can be reached from your system in under a minute and made to work for you. All you have to do--now that you have got your system and your ST80III System--is to know how to bring them into use.

Matching in with the requirements of another system, or network depends both on how much the system knows about your situation, and how much it needs to know to serve you. A networked data-base that provided stock-market prices to TRS-80 users exclusively would need very little information.

However another, actually more powerful network which also provided computational power to value your portfolio automatically would need MORE data to be able to perform its tasks. Don't get mislead into thinking systems that demand more data are the more sophisticated ones.

ST80III System provides for these cases, allowing you to make the decisions based upon what is available out there, rather than on any built-in limitations of the software.

TRS-80 & OTHER MICRO SERVICES

In this section you will start by considering the simple networks arranged for ST-80 users, and micro-computer users in general. As these networks do know quite a lot about your system, there is not too much you have to do ... but doing some of the work AHEAD of the time you plan to connect up is worthwhile. After all, you are probably intending to repeatedly communicate with the network in the future, so let ST80III System and you work together to make such communications simple and as economic as possible. (Practically all networks charge by the minute, remember!)

DIRECT GENERAL COMPUTER SERVICES

From micro-systems you can even hook into the great world of computer service bureaus--such as Comserve, Inc., of Buffalo, NY; TAX, a service for lawyers and CPA's; and other similar services.

COMMUNICATION NETWORK SERVICES

Finally, we go OUTSIDE the world into the greatest communication systems ever created--now accessable to you at bargain-basement prices.   The satellite transmitted messages of TYMSHARE and TELENET exemplify the power of computer to computer communications that stretch from Australia to Norway to just about anywhere in the world that you would want to reach.

EVERYTHING NOW WAITING FOR YOU

This is the point where you graduate. A telephone call to your local outlet brings in the data-bases and computational facilities that are remaking the world.   The New York Times services--or the engineering services or other professional services that you may need. The news, economic, medical, historical services all ready for you in a way that the great governments were unable to command a few short years ago. They are there for the waiting.

Enough of talking--now let us get to the actions needed to contact them, starting again at the small end, our own ST80 networks....

III. A. TWO-STEP METHOD FOR TIEING IN TO A FORUM-80 SYSTEM

        Tieing in to a FORUM-80 ideally is performed in two steps, as
described below.   In the first step ST80 is set up to automatically
log you on, on telephone contact being made. (Automatic Log-On is an
optional feature, of course, and does not have to be used. You can
contact your FORUM without it, using a modified version of the Second
part of this receipe.)

        The second step is then performed when you are ready to
actually connect.   You will need the FORUM-80 number and hours; of
course, these can be obtained from the SBSG FORUM-80 (using the Forum
automated method - phone <617> 692 - 3973 . The same procedure with your
own local numbers then puts you into contact with TRS-80 support in
your own area, including program exchange and general information.

        PART ONE -   PREPARING THE AUTO-LOG ON MESSAGE FOR FORUM   —

    No: PROMPT GIVEN AND ACTION TO BE TAKEN

    1 : On DOS READY, give BASIC <ENTER>

    2 : Press <ENTER> in response to
      : Memory Size & How Many File Questions.

    3 : Give RUN "TCONV/BAS"<ENTER> in response to BASIC READY

    4 : Give "L" in response to Menu.

    5 : Give Forum Logon Message as instructed by your Forum.

    6 : Give "N" if Logon Message is correctly displayed back.

    7 : Give "S" to Save the new AutoLogon Message

    8 : On Prompt for file name provide the name for your FORUM

    9 : Give "E" to Exit

PART TWO - USING THE AUTO-LOG ON MESSAGE TO LOG-ON FORUM

No: PROMPT GIVEN AND ACTION TO BE TAKEN

1 : On DOS READY, give ST80III FORUM (or whatever name you
  : selected in Step 8 above)

2 : Type SHIFT, I & UP-ARROW

3 : Give 2,1,3,1 to four subsequent questions.

4 : Set Coupler to "Originate" or "O".

5 : Dial FORUM80 number, listen to check that line is
  : available, and cradle telephone.

6 : On "Log-on Please", press "M",SHIFT and UP-ARROW
  : simultaneously.

7 : If "Log-On Please" repeats, Press "M", SHIFT and
  : "UP-ARROW" simultaneously.

8 : Respond to FORUM80 questions as you need: now you are
  : in contact with the system.

CHANGING THE LOG-ON MESSAGE

Where the log-on message already exists, the first response in
the TABLECONVERT program is to provide the old table name rather than
simply pressing ENTER, as instructed above, or TABLE/TBL where you
were wanting to use the standard default tables as a basis for your
own changes.

FORUM TABLES ARE SUPPLIED

Your particular ST80III includes an already complete set of
FORUM tables without any log-on message.

In the use of TCONV/BAS, you should change these FORUM tables
rather than create new ones.

IV. A GROUP OF TUTORIAL SUBJECTS

The following sections take up a number of subjects separately.   Currently this list includes:

IV. A. THE THREE PAIRS OF TRANSMISSION COMMANDS

ST80III centers around a basic group of Commands which can be conveniently thought of as the GOP pairs, listed below, and then described individually.

```
Get, coded "G" . . . .. File, coded "F"
Output or "O". . . .... Collect coded "C", or accept
Print, coded "P". . . . Stop Printing, coded "S".
```

THE GET/FILE PAIR

The Get and File Pair of transmission commands handle the movement of the transmitted material to and from memory. ST80III is a memory-to-memory communications package, and the action of bringing material from disk to the memory, or filing it from memory to the disk, are the responsibility of the GET/FILE pair.

The Get instruction is a ST80III Keyboard Command with G.   In operation it responds with a prompt for the file name that is to be transmitted. When the name is given, GET brings this file into memory and reverts control back to the operator.

The File instruction is another ST80III Keyboard Command with F.   In operation it also prompts for a file name --this time the name that is to be used for the material already in memory which is to be stored on the disk.   When the file name is given by the operator, the store operation takes place, and control is reverted to the operator.

THE OUTPUT & COLLECT PAIR

The transmission requires very different routines on either side of the transmission.   ST80III uses two commands to handle the different sides of this operation, the O or OUTPUT command, and the C or COLLECT command.

Both commands are given from their respective keyboards, assuming that both sides of the operation are being handled by ST80III, and the normal form of any KEYBOARD COMMAND is used; i.e. SHIFT, UP-ARROW, and the letter O or C pressed together.

PRINTING ON/OFF INSTRUCTIONS

The transmission can be monitored onto the parallel port printer, if desired, AND if the printer is fast enough to keep up with ST80III.   Monitoring does not have to be performed throughout.   For instance, there is little value in monitoring the setting up instructions either of a time sharing service, or of any other transmission controls. ST80III, therefore, provides for it to be turned on with ST80III Keyboard Command (P for PRINT) and for it to be turned off by ST80III Keyboard Command (S for STOP PRINT).   It's as easy as that!

FILE NAMES CAN DIFFER

Another item comes up: Looking at the list of instructions for a double file movement, it becomes obvious that we must have some reference to file names, and that they must be able to differ. ST80III asks for a file-name every time that a GET or FILE instruction is given.   The file names are given in the normal manner INCLUDING attributes such as /BAS, and disk addresses if more than one copy of the file may exist.

REMEMBER - GOP CAN STILL FIGHT!

In use, the order in which you use them will differ as to whether you are receiving or transmitting, and whether you have already been in operation.   When the ST80III is initialized, for instance, printing is not ON; but if you have used it previously, then it will be ON until it has been turned OFF.

The Logical order then will be:

```
GET            -a file (Only on the Transmitting Side).
OUTPUT         -the File (Again only on the
                transmitting Side)
PRINT          -any transmission received (Optional,
                and on the Receiving Side)
COLLECT        -transmission (Receiving Side)
STOP PRINTING  -(Optional - Receiving Side)
FILE           -what has been received (Receiving Side)
```

"GOP Can Still Fight" is a quick mnemonic to keep these in order.

MULTI-FILE TRANSMISSIONS

Once one file has been transmitted, there is no reason why a separate file is not transmitted in either direction. Consider the following set of ST80III Commands:

```
GET file-name 1/OUTPUT
ACCEPT/FILE file-name 1
GET file-name 2/OUTPUT
ACCEPT/FILE file name 2.
```

Can you tell from this what is happening? Look over the instruction stream, and try to define just which end is giving each instruction, if possible, and what the instruction means. You can do this by looking at the four pairs above. (Two separate files are transferred in turn.)

IV. B. THE TRANSMISSION SPEED CONTROL COMMANDS

The maximum speed that a transmission takes place is set at the output computer, and so are any changes in this speed.   Speed is measured in the number of bits per second (called BAUDS) that are transmitted, and ST80III provides for 7 different speeds: 110, 300, 600, 1200, 2400 4800, and 9600 bauds.   Each of these is used in some standard communication manner.

Normally, there will be no need to change these speeds, but there are two situations which require speed control to be provided. These are when a time-sharing service becomes overloaded, or when either the receiver or the sender is trying to monitor the material as it is going through.

PERMANENT SPEED CHANGES

ST80III provides for both permanent and temporary speed control changes during transmission.   The permanent control is the INITIATE or "I" Command which can be given from the transmitting unit.   As it indicates, this effectively re-initiates all the ST80III system and, if used, you have to reset your printer and any other controls—so use "I" with caution and understanding.

TEMPORARY SPEED CHANGES

Speed changes can be made with the use of the Up-ARROW & S reducing the speed, and Up-ARROW & F increasing it. (SLOW and FAST). These are given as Control by being pressed with the UP-ARROW key. The UP-ARROW & H will HALT transmission, the UP-ARROW & R will RESTART transmission and the CLEAR key will cancel transmission.

Whatever speed is originally set is the maximum—it is no good giving the UP-ARROW F first. The Speed Up command is really just a recovery facility.   And, of course, it is no good giving the instruction to the wrong computer—it is only the transmitting computer that has any direct control of the speed.

TIME SHARING SYSTEMS MAY HAVE VARIABLE SPEEDS

In time sharing systems, the host computer has to handle all the users who are currently receiving or sending material: its effective speed at your terminal/computer will be changed by the number of users. As this is a constantly changing number, the effective speed even for the same service may differ between different times that you access the service, and even during a single call.

If you find that this type of variation is taking place, use the temporary speed variations both to identify just what is the acceptable speed and to provide for good transmissions.

IV. C. QUALITY ASSURANCE IS CERTAINLY NEEDED

Quality assurance is doing some extra work to reduce waste work. Now that you understand the basic methods of ST80III's transmission methods, it is· time to consider these additional few steps.

ST80 has quality assurance systems--but it is up to the operator to use them. This section goes through a number of the facilities that should be routinely used, first on an individual basis, and then putting them all together around the actual transmission action.

Special Quality Assurance System components provided are:

> FILE TYPE, filed FTYPE/CMD, called by "FTYPE"
> under DOS
>
> CHECK SUM, filed CKSUM/CMD, called by "CKSUM"
> under DOS
>
> ST80III Echo Checks To Video:
>
> These are obtained by setting the Modem on
> Half-Duplex, which then should display
> anything that you insert from the keyboard.
> If it does this correctly, your connections
> to and from the modem appear to be complete.

FILE SUITABLITY ASSURANCE - "FTYPE"

The File Type program checks that the file which you plan to transmit is suitable for transmission. ST80III operates on the standard information interchange code, ASCII, and not on the normal ST80III internal file storage codes. The ST80 operating systems will use the ASCII if instructed to (This is done by placing a comma & A (",A") at the end of the file specification--see TRS 80 manuals), but other files stored in the normal manner can also be handled after being converted to ASCII.

The FTYPE quality assurance function is to check that the file either has been converted to, or was originally stored, in ASCII. To do this, simply call DOS and run the FTYPE command.

The file is faulty if the type is not identifed as being ASCII. To correct this condition, use the BTA program-- but remember to revert the transmitted file back to Binary before using it again!

TRANSMISSION SUCCESS ASSURANCE - "CKSUM"

Even when the file is correct, it is possible that something will go wrong during the actual transmission over the telephone wires. To prevent such a faultily transmitted file from being accepted, a checksum is taken before and after the transmission, and then manually compared. If there is a difference, the transmitted file should be discarded.

The BEFORE run of CHKSUM can take place once the file test has been successfully loaded into memory and filed on disk; exit to DOS. When DOS READY appears, the CKSUM Command should be given. Checksum produces a number which should be noted carefully and provided to the accepting operator.

The AFTER run of CHKSUM can be timed to the mutual convenience of both operators. If more than one file is being transmitted at a time, the checking of the transmitted file can be done in batches.

CHECK SUM TESTING PROCEDURES

Check sum positioning relates to the file actually transmitted when the program is being used for quality assurance of the transmission. As such, it should be applied to the file as it is transmitted--in ASCII form. If the file is actually in binary and is converted to and from ASCII, the transmission quality assurance should be run after the first conversion and before the second one.

TRANSMISSION CONNECTION QUALITY ASSURANCE

ST80III will only operate when the connections are fully working. The connections of the interfaces on both sides of the proposed transmission should be checked independently before transmission is started. Sometimes it happens that a connection may appear to be there but, in fact, is only there sometimes.

The RS 232 cable and RS 232-C board connections are particularly liable to be poor connections. They can be firmed up by the use of an elastic band around the cable connector and the cradle for the phone mouthpiece. It may not look good, but it works!

Remember that it may be necessary to check BOTH ends of the cable connections. Such checks can be made independently prior to transmission by setting the MODEM to test mode, loading the ST80III program and initiating it, and then using the keyboard to input all of the available characters. These will be echoed through the cable to your own video screen. If the echo is correct, the quality assurance test has been passed.

TRANSMISSION PROGRAM QUALITY ASSURANCE

Programs such as ST80III also can be incomplete even when they appear to be working. Like cable connections they can be checked. To check your ST80III, run the DOS command CKSUM on your system when you first receive it from SBSG and note the answer. Don't worry if someone else's answer for their system is different--only worry about your own system.

Then, note the check sum, and re-run the check at the start of a transmission section. If the number does not agree, re-load and, if necessary, recopy from your master disk before proceeding.

V. THE CONTROL STRUCTURE OF ST80III

The interpretation of the Keyboard and data-stream commands, such as "F"--Save This File, or ESCape to Graphics--given during an actual transmission, is performed by the use of preset variables. Some of these are set by the ST80III user during each transmission. Here the operator has an opportunity to set four controls--baud speed, etc. Most of the actual controls, however, are set internally in accordance with standard data processing communications practice. No change will be needed to any of these if communications are restricted to other compatible systems, such as FORUM, or other ST80III users.

The only preset operation which a user connecting to a compatible system may want to use is the AUTOMATIC LOG-ON feature. Unlike the other pre-set conditions, there is no default value carried for this feature in the ST80III package as delivered. The AUTOMATIC LOG-ON FEATURE is described below in Section V (A). The balance of this section is particularly for use when changes are to be made to the default tables, beyond the rate changes, or the LOG-ON feature.

V. A. THE AUTOMATIC LOG-ON CONTROL - AN OUTWARD CONTROL

The Automatic LOG-ON Control consists of a 63-byte field which is transmitted each time the ST80III Keyboard Command "M" is pressed or repeated under ST80III Keyboard Command "K". While it can be used for other purposes, it is designed to include the normal log-on features of name, password, account number, in whatever sequence any time-sharing system or network may require them.

There is no default used by ST80III if no automatic LOG-ON message has been loaded. In this, the automatic LOG-ON is different from the other systems.

The setting of an automatic log-in is initially performed under TCONV/BAS, as described generally in Section III(A). On the Main Menu, the Response "L" for LOG-ON is given. The current LOG-ON message is displayed, if there is one. If there is no current log-on message the word "NONE" is displayed. If there is to be a new message, it is then accepted from the keyboard and checked for length--the maximum length being 63 characters. Control characters are entered as lower case characters.

Once an acceptable message is given, it is placed in the LOG-ON position, and is then ready for being output whenever an ST80III Keyboard Command "M" is given.

V. B.   ST80III MAINTENANCE OF VIDEO & GRAPHICS

ST80III maintains the video and graphics control table through the standard Table Conversion program TCONV/BAS. The TCONV menu includes the Option V which permits the change of the Video Translation table as needed.   It is also a self-prompting and self-explaining program that can be studied from your computer.

The routine will provide original entries for as many byte patterns as you want to have intercepted, and appropriate output bytes that are to be used to replace such characters. Display of the current contents of the Video Table and cancellation of any entries not wanted are also provided in the routine.

Entry to the routine can be obtained by exiting from ST80III using the KEYBOARD COMMAND "E" for EXIT, the DOS instruction BASIC, and the BASIC instruction RUN "TCONV/BAS".

These internal tables provide respectively for your own printer disk and video interfaces, and for changing the control characters of any remote system so that it can use its own coding specifications to open and close buffers, and stop and start transmissions automatically.

Any specific communicating network or computer can have a special group of tables covering these interfaces. Thus, if you are sometimes contacting your university computer system, and sometimes your corporation's computer system, you would probably prepare different sets of tables for each of them, with their different translations, LOG-ON codes, etc.

These separate tables are called by giving their special names immediately after the DOS call "ST80III".

In this way, the call "ST80III COLLEGE <ENTER> would load one set of tables, while the call "ST80III FIRM <ENTER>" would load a different one. From the operator's, point of view, however, the actual operations would proceed identically--although the two communication systems would be working differently.

The workings of these three sets of built-in controls are described in the following sections. The use of the TCONV/BAS Explain feature is also recommended.

> (C) PRINTER & DISK TABLE OPERATIONS & CONTROLS
> (D) VIDEO TRANSLATION OPERATIONS & CONTROLS
> (E) GRAPHICS OPERATIONS & CONTROLS

V. C. PRINTER & DISK TRANSLATION TABLE: OPERATIONS & CONTROLS

A Serial port input is first monitored by ST80III to determine if it is a control character, such as Line Feed. No change will be made to any characters received that are not control characters. In the event that a control character is received, however, it will be checked against the current contents of the PRINTER TRANSLATION table. For a character to have an effect on the printer it MUST be found in the table, as otherwise it is treated by ST80III as being a null character and suppressed.

When a control character is found in the Printer Translation table, the corresponding character which applies for the particular printer in use is passed on to the printer. It may, but need not, be the same character.

Setting up the Printer Translation is performed under TCONV/BAS as described generally above. In the Main Menu, the response "P" will produce a list of the current contents of the eight items kept in the Printer Table. Each of these can be changed separately. When the table is correct for any particular printing situation, it can be saved through the use of the Main Menu "S" instruction under TCONV/BAS.

Because of the particular controls used by certain Radio Shack printers, such as the Quick Printer, further tests are made of the control character normally output. If this is X'0D', indicating a RETURN, the immediately prior character is checked to see if it was also a RETURN. If so, the second RETURN is converted into a LINE FEED. This is part of the printer driving routine.

This is an automatic check, and is not controlled by the table contents.

DISK FORMATS AND CHARACTERS

Particularly in time-sharing systems, nulls and other control characters are transmitted and will neither be wanted by the printer or eventually with the standard material when it is stored on disk. This special formatting of the input is handled simply by not storing such characters in the PRINTER TRANSLATION table. Disk storage is also formatted by the same omissions (although not by the change of second returns to line feeds as described above). In the event that different formatting of such characters is wanted for the disk storage for the printer control, a special table must be created.

V. D. VIDEO TRANSLATION OPERATIONS & CONTROLS

There are both some control and some coding characters which are inserted into the data-stream along with the data being transmitted. These are removed from the transmitted stream by ST80III and acted upon as necessary so that the actual data stream, and only the data stream, will be displayed for monitoring purposes on your computer video.

Performing these various tasks is handled by the ST80III in a table-driven Video Translation. All bytes, as they are received at the serial port, are first reviewed against the standard ASCII ESCape character X'1B'. If such a character is received, the next non-null character byte is moved into the graphics code area by the addition of a one-bit in the most significant bit position of the eight-bit byte, while the ESCape byte is dropped from the stream.

Null characters are then deleted from the input stream, and the created graphic characters and unchanged other characters are checked against the Video Translation table. If an entry is found in the table for their particular bit-pattern, the original received byte is replaced by the corresponding byte stored in the Translation table.

The Video Translation Table is used primarily to make control characters from a time-sharing computer compatible with ST80's requirements. For example, a timesharing computer may send a hexadecimal 1B as an instruction to clear the video screen. ST80 uses a different byte pattern for this control function, which happens to be X'1C' + X'1F'.

Loading the Video Translation Table with X'1B' on one side, and X'1C' on the output side, will result in the appropriate control character being given in the correct place, and the cursor to be moved to the home position.

Notably, this substitution does not impact the use of '0C'. If a ST80III control character does appear in the stream, and it is not the subject of an entry in the Table, it will act in the ordinary way. In the example used, for instance, if the X'1B'/X'1C' entry was the only one in the Table. The cursor would be moved to the home position whenever either X'1B' or X'1C' appeared in the transmission.

VI.   ST8ØIII CONTROLS USED DURING TRANSMISSION

There are three major groups of commands used during transmission, as opposed to being pre-set prior to the transmission actually occurring. These are the Alphabetic/ Non-Alphabetic Keyboard Commands, and Internal Commands. In general, the user will have the greatest use of the Alphabetic Keyboard Commands, which both provide guidance as to the meaning of the various Commands, and are used throughout as noted above in the various Cook-Book and Tutorial areas. The first part of this Section provides a complete list of these in alphabetical order.

The Non-Alphabetic Keyboard Commands are used to expand the facilities of the rather limited TRS-80 keyboard, so permitting the normal timesharing functions to be given from the keyboard, if necessary. These are listd in Section VI (B).

The last Section, VI (C), describes the internal command structure which is implemented following the receipt of the stream. Graphic codes are included in this portion.

VI.   A.   ST8ØIII ALPHABETIC KEYBOARD COMMANDS

The ST8ØIII program uses a Command-driven group of separate routines, each identified with a specific letter as in Table "A". The live TRS-80 keyboard is monitored whenever the ST8ØIII program is READY. This monitoring checks for a combination of the SHIFT, UP-ARROW, and any letter. On this combination occurring, the program goes to the specific routine and either completes the task without further information being provided from the console, or returns to seek additional data and directions as described following.

*** TABLE OF ALPHABETIC LIST OF KEYBOARD LETTER COMMANDS ***

KEYBOARD LETTER COMMAND "A" (TRANSMIT A "BREAK-INSTRUCTION")

KEYBOARD LETTER COMMAND "B" (LINE-FEED INSTRUCTION TURNED ON)

Computers and communication networks vary as to whether they treat a 'Carriage Return' or 'New Line' character as including a 'Line Feed'. An error in assuming that a line feed is included in any return instruction will result on a video screen with the next line being displayed over the prior line, instead of below it. In the opposite direction, an error in giving an additional line feed on the assumption that one is going to be needed will result in a printer spacing lines twice as far apart as they should be.

ST8ØIII provides for the user to handle either case. At the start of use, ST8ØIII does NOT put out line feeds with returns. If it is known that they are needed, or if difficulties develop that suggest they are needed, KEYBOARD LETTER COMMAND "B" causes one line feed

character to be transmitted each time a return character is transmitted.
KEYBOARD LETTER COMMAND "D" reverses the effect of KEYBOARD LETTER COMMAND "B".

KEYBOARD LETTER COMMAND "C" (COLLECT)

ST80III opens a memory buffer that starts at the end of the program and goes to the end of memory. NO MEMORY PROTECTION is provided, so any machine-language programs in high memory will be overwritten.

The Collection buffer is used to hold a transmission in compressed form as it is being received. KEYBOARD LETTER COMMAND "X" closes a Collection buffer, reversing the effect of KEYBOARD LETTER COMMAND "C".

KEYBOARD LETTER COMMAND "D" (NO LINE FEED)

KEYBOARD LETTER COMMAND "D" reverses the effect of any prior KEYBOARD LETTER COMMAND "B" instruction, and causes ST80III to send out Return characters without an accompanying line feed.

KEYBOARD LETTER COMMAND "E" (EXIT)

KEYBOARD LETTER COMMAND "E" is the standard exit from ST80III. This should not be taken when there has been a transmission until any files in memory have been saved--by the file instruction KEYBOARD LETTER COMMAND "F", and before all files have been returned to their correct form if they have been converted from Binary to ASCII form through the use of the special ST80III BTA command under DOS.

Use of KEYBOARD LETTER COMMAND "E" results in the destruction of any material in memory, and all prior settings of transmission speed, characteristics, etc. To return to ST80III in the event that KEYBOARD LETTER COMMAND "E" is given in error, give the Command ST80III on DOS READY, and re-initialize the routines and the files as necessary.

KEYBOARD LETTER COMMAND "F" (FILE)

Once a transmission has been collected in memory, and the transmission has ceased, the material can be processed for storing on the disk in ASCII form (not binary). This is performed by the KEYBOARD LETTER COMMAND "F" command. The name of the stored file is provided by the user in response to a prompt after the KEYBOARD LETTER COMMAND "F" has been initiated. This should be given in the normal form, such as PROGRAMA/BAS for a Basic Program file.

KEYBOARD LETTER COMMAND "G" (GET)

KEYBOARD LETTER COMMAND "G" brings down a disk file from the disk and places it in a Transmission Buffer in memory. The file is placed in compressed form during the load from disk into memory.

The file to be loaded into the Transmission buffer is identified by a file specification given in the normal manner, with any necesary attributes. Examples are DATA/TXT, DATA/TXT:2, DATA/TXT:0 etc.

KEYBOARD LETTER COMMAND "H" (HELP)

ST80III maintains a complete list of the keyboard commands available in the system, and displays it on KEYBOARD LETTER COMMAND H.

KEYBOARD LETTER COMMAND "I" (INITIALIZE)

ST80III starts by asking whether the hardware switches of baud rate, word length, etc., are to be used. If not, it allows the user to set them in the software. Where it appears that an error has been made, the same settings can be re-set at any time through the KEYBOARD LETTER COMMAND "I" instruction.

This is particularly useful in correcting the baud rate to be used to match the maximum speed that is practical at a particular time.

KEYBOARD LETTER COMMAND "J" (JOB-ENTRY LOG)

Makes an entry on the ST80III Job-entry Log.

KEYBOARD LETTER COMMAND "K" (REPEAT LAST COMMAND)

Repeats the immediately prior ST80III command. This is particularly useful with the automatic log-on command which is often called upon to be repeated during the inital connections.

KEYBOARD LETTER COMMAND "L" (LOWER-CASE)

The keyboards of some TRS-80s do not use lower case letters. Under these conditions, ST80III interprets letters from your keyboard as always being upper case. However, while this is the initial condition, ST80III permits the use of the keyboard to provide either lower or upper case after a KEYBOARD LETTER COMMAND "L" is given. KEYBOARD LETTER COMMAND "U" (UPPER) reverses the effect of KEYBOARD LETTER COMMAND L, and reverts your keyboard into an upper case one. KEYBOARD LETTER COMMAND "L" is used in conjunction with the SHIFT and DOWN ARROW keys pressed simultaneously. When first invoked, KEYBOARD LETTER COMMAND "L" will make any character sent without the Shift being simultaneously pressed be in UPPER case. Pressing the SHIFT and DOWN ARROW makes your keyboard work like a typewriter, where the unshifted characters are regarded as being in LOWER case. The SHIFT & DOWN ARROW control reverses the way the keyboard characters are to be interpreted as many times as it is given. However, the shape of the cursor at any time shows the current interpretation ... an underline cursor indicates that TYPEWRITER coding is being used, while a solid block cursor indicates that KEY-PUNCH coding is being used. To

remember this, remember that underlining is primarily a TYPEWRITER function, and not always available on other media.

KEYBOARD LETTER COMMAND "M" (MESSAGE)

If previously arranged, ST80III will hold a coded message which will log you on to a particular system--up to 63 characters. The transmission of this message will occur simply by giving KEYBOARD LETTER COMMAND "M" on making contact with the system you want to log onto.

KEYBOARD LETTER COMMAND "N" (NUMBER OF NULLS)

Sets the number of nulls to be used during a transmission, and displays it.

KEYBOARD LETTER COMMAND "O" (OUTPUT)

Once the Transmission Buffer has been loaded, and all other preparations for the transmission have been made, KEYBOARD LETTER COMMAND "O" will start the transmission. The transmission may still be held up if the other computer is not ready to collect it--see KEYBOARD LETTER COMMAND "C".

KEYBOARD LETTER COMMAND "P" (PRINTER ON)

Normally, ST80III does not monitor or print the incoming data being collected from some communicating system. It is sometimes convenient to do so, provided that the transmission speed is never too fast for your printer. KEYBOARD LETTER COMMAND "P" causes the printer to receive all information that is transmitted except for inserted control characters, such as nulls, etc. Printing is handled through the parallel port. KEYBOARD LETTER COMMAND "S" (STOP Printing, or Silence) reverses the effect of KEYBOARD LETTER COMMAND "P".

KEYBOARD LETTER COMMAND "Q" (QUERY: DISPLAY THE SWITCH STATUS)

This is an informative display that allows the ST80III operator to confirm the precise operational mode in use. The display shows the current baud rate, and other relevant information.

KEYBOARD LETTER COMMAND "R" (ENABLES INTERRUPTS)

Your computer has two facilities which cannot be used together--the CLOCK, and disk or tape loading. The reason for this is that the tape and disk input/output systems have precise timing built into them upon the assumption that no clock operations are in progress. ST80III "R" and "T" (which reverses the effect of ST80III "R") enables and disables the interrupts, thus permitting proper operation.

KEYBOARD LETTER COMMAND "S" (STOP Printing or SILENCE)

Command "S" turns the print transmission monitoring off, reversing the effect of a prior KEYBOARD LETTER COMMAND "P".

KEYBOARD LETTER COMMAND "T" (DISABLE INTERRUPTS)

Equivalent to a CMD "T" in Disk Basic.

KEYBOARD LETTER COMMAND "U" (UPPER CASE ONLY)

Forces all keyboard input into upper case, reversing the effect of any prior KEYBOARD LETTER COMMAND "L" (LOWER).

KEYBOARD LETTER COMMAND "V" (TRANSMISSION AUTO-LINE FEED OFF)

ST80III "V" reverses the effect of ST80III "Y", described below.

KEYBOARD LETTER COMMAND "W" (WARM START)

Re-starts the already loaded ST80III. This is used if you want to clear away any settings or other entries that either end of a transmission may have caused. You use this command to load a new table module without rerunning ST80III.

KEYBOARD LETTER COMMAND "X" (CLOSE MEMORY BUFFER)

This command closes the Collection Buffer in Memory, reversing the effect of any prior Command "C".

KEYBOARD LETTER COMMAND "Y" (TRANSMISSION AUTO=LINE FEED ON)

ST80III can be set to automatically transmit a line-feed after each Return character, if this is appropriate. The setting is performed from the keyboard through SBSG's ST80III "Y", and can be reversed similarly by ST80III "V".

KEYBOARD LETTER COMMAND "Z" (ZERO CLOCK)

Sets the system clock at 00 hours, 00 minutes. This enables telephone calls and connect time to be monitored easily. We use this to evaluate response time on some time sharing systems.

VI. B. ST80III KEYBOARD SPECIAL COMMANDS

Communications needs a fuller keyboard than does a dedicated, non-communicating computer. Many TRS-80's do not have full keyboards, so ST80III includes appropriate keyboard controls from the basic keyboard to permit special commands to be given.

Five special commands are provided, and are listed below.

BREAK - To transmit a Break instruction, press the BREAK Key.

ESCape - To transmit an ESCape instruction, Press the CLEAR Key.

RUB-OUT - To transmit a RUB-OUT instruction, press the LEFT ARROW key. Note: This is sent as a DELETE X'7F' byte. If a different code is needed, the Table Convert Program should be used to set the appropriate code.

CONTROL - Control codes "A" through "Z", or "0" through "9", are sent by pressing the UP-ARROW key and the appropriate letter or Digit. Note: The Controls 0 through 9 can be set to any byte pattern desired through the Table Convert Program. The SHIFT key is NOT pressed during sending these controls.

REPEAT - Repeat of characters, as for underlining, or rows of periods, is sent by pressing the RIGHT ARROW with the key for the character that is to be repeated.

VI. C. ST80III'S NON-KEYBOARD COMMANDS

ST80III is not just responsive to the commands given from the keyboard noted above. In addition, ST80III reviews the transmission stream for specific control functions that are needed to successfully provide for ease of use.

The transmission stream commands are always in the form of 8-bit bytes, such as 01101010. These bytes are normally broken up into 2 four-bit hexadecimal numbers. Hexadecimal is based on the Latin word for sixteen, and is written in a number of ways in computers. One way is to use the first six alphabetic letters to supplement the ten decimal numbers - 1, 2--9, 0, A, B, C, D, E, and F.

In this way a byte is fully defined by the use of two numeric or alphabetic characters, such as 7F. Here the first 7 would indicate the pattern 0111, and the "F" would indicate 1111. The full byte would then be 01111111.

In this book, the method adopted is to keep everything as explicit as possible by using the "X" convention, and following the letter "X" (meaning hexadecimal) with the two digits in quotes. Thus, the pattern 01111111 would be written X'7F'.

These include three distinct functional groups, the Inward Data Control Codes, also called Data Codes 1 through 4; and the Graphics Codes, as well as certain miscellaneous codes for cursor control.

INWARD DATA CONTROL CODES

The group of X'11' through X'14' are reserved for special controls, also referenced as being Data Codes 1,2,3,4. They control the actual transmission buffers and stream so that any buffer overflow condition can be recognized before it occurs, and prevented from interrupting the accurate transmission of the data stream.

HEXADECIMAL COMMANDS

X'0C' - CLEAR SCREEN and Home the Cursor.

X'11' - Re-starts a halted transmission.

X'12' - Opens a buffer to collect any transmitted data in the receiving computer.   This is equivalent to the Keyboard Command "C" or COLLECT.

X'13' - Transmission Halt instruction.   This is also referred to as Data Code 3 instruction.   Transmission will be re-started when a X'11' or Data Code 1 is received.

X'14' - Closes any already open Collection Buffer in memory. This is equivalent to the Keyboard Command 'X'.

X'1B'   ESCape in ASCII.

VII. ST80III SPEEDS & SPECIFICATIONS

ST80III is organized to provide the most efficient communications possible. It would be nice if this were possible in a way that permitted exact specifications as to how much buffer and time were to be taken to transmit or collect a specific length file...but as both the normal file storage methods used in your computer AND ST80III are optimized to give you the best capabilities, this is not possible.

A typical instance deals with files including a lot of zeros. Many accounting or mathematical files do include zeros, often with more than two zeros next to each other.

It is possible to code the number of zeros, using ordinary numbers. For instance, 05 could de-code to five zeros, although it only took two characters. This would save three characters...but would make it necessary to know just how many such strings of zeros existed in a file before estimating how much room it would take to store the file in memory. It could be done, but is normally not worth it.

In general, a full 48K system can transmit or receive a compressed file length up to 28 granules. This is normally equivalent to about 40 uncompressed granules in the case of text material. The smaller system capacities are 15 compressed or 22 uncompressed (text) granules files for a 32K system, and 2 granules for a 16K system.

This restricts only the length of a single transmission reception.

OPERATING SYSTEM

ST80III may now be run with any TRSDOS type operating system including NEWDOS and NEWDOS 3.0 (based on an advanced release).   It may also be used with TRSDOS(R) version 2.1 or later and VTOS(R) version 3.0 or later. The program is recommended for use with VTOS 3.1 which supports all features implemented in this revision.

SINGLE DRIVE PARAMETER CHANGES

To operate any of the utility programs (CKSUM, FTYPE, ATB and BTA) on a single drive system, just type the name of the program and omit parameters.   After DOS loads the program, you will be prompted for parameters. The (BREAK) key returns you to DOS. If you have used any of the programs in the Microsoft FORTRAN package, you will find these utility programs work the same way.

CONTROL CHARACTERS IN LOGON MESSAGE

You may now include most control characters in your auto logon message.   To do this, you must own KVP 2.3, or KVP232 1.2 or later.

Instructions in the KVP programs explain how.   You   can   also   insert
control characters into auto-logon by using lower case characters.

HEX DEFAULT FILE EXTENSION

        The   default file extension /HEX is added to the output
filespec of BTA, and the input filespec of ATB.

JOB LOG (VTOS ONLY)

        All of the utility programs document their operation via the
*JL Device.

DEVICE DRIVEN I/O (VTOS ONLY)

        All of the utility programs will accept either a device name
or a filespec to satisfy an input or output parameter.   ST80III will
also accept either a device name or filespec to satisfy either the
input or output parameter when transferring data to or from the memory
buffer. The specification for the translation table, however, must be
a filespec (default extension /TBL). The basic I/O driver routines
(KEYBOARD, VIDEO, and LINE PRINTER) of ST80III are part of the load
module. They operate totally independently of the routine in the
TRS-80 ROM.   Thus, they are not affected by routing or program
CHAINing.

AUTO & CMD"I"

        ST80III and all of its utilities will now work correctly if
called from BASIC or by the AUTO command under DOS.

CHAIN (VTOS ONLY)

        The CHAIN command may be used to load and begin execution of
ST80III. However, once execution begins, the /JCL file will be
ignored until the user exits the ST80III program and returns back to
DOS.

COMPARISON CHART
ST80™

	$25 ST80-UC Model I	$79 ST80-II Model I	$150 ST80-III Model I	$200 ST80-III Model II
Retail Prices / Program name / TRS-80™ System				
Selectable RS232 setting	N	Y	R	Y
HELP Display	N	Y	R	Y
UP loading - Tape	Y	N	N	-
UP loading - Disk	N	Y	Y	Y
DOWN loading - Disk	N	Y	Y	Y
Prompted Up loading	N	N	Y	Y
VERIPROMPT™	*	N	*	Y
ECHO	N	N	*	Y
FEEDBACK	N	N	*	Y
Video Margin	N	N	N	Y
Operating system support				
Level II BASIC	Y	N	N	-
TRSDOS™	Y	Y	Y	Y
NEWDOS 2.1™	Y	Y	Y	-
VTOS™	Y	Y	Y	-
CP/M™	N	N	N	*
DOS Command support	N	N	N	T
Video display modes				
SCROLL	Y	Y	Y	Y
FORMAT	N	N	*	Y
PAGE	N	N	*	N
REVERSE VIDEO	-	-	-	Y
CURSOR <ON/OFF>	N	Y	Y	Y
DIRECT CURSOR ADDRESSING	*	N	*	Y
Transmit Line Feed	N	N	Y	Y
Printer Support				
PARALLEL PORT	Y	Y	Y	Y
SERIAL PORT B	-	-	Y	Y
Transmit Nulls	N	N	Y	N
RS-232 Test	Y	N	N	N
Job log	N	N	V	N
User Trans Tables	N	2	2	3
Auto logon	N	Y	Y	Y
Function Keys (definable)	N	10	10	6
RUBOUT Key (definable)	N	Y	Y	Y
Warm Restart	N	N	Y	Y
Run on disk	Y	N	Y	-
The Connection Support	Y	N	Y	Y
Automatic I.D.	N	N	Y	Y
Utility Package	N	Y	Y	Y
Future Updates Planned	Y	N	Y	Y
True Break	Y	Y	Y	Y

Notes

* Indicates feature not currently available now, but future releases of this product will probably include this feature.

– Indicates that this feature is not applicable (no hardware or software support is available).

R Indicates that this feature is only available when using the Radio Shack RS-232-C serial board.

T Indicates that this feature is only available with Radio Shack TRSDOS™.

V Indicates that this feature is only available with VTOS™.

NOTE: There will be two versions of ST80-III™ for the TRS-80™ Model II - one version for use with TRSDOS™, and the second for use with Lifeboat's CP/M™. Users who wish to purchase both Model II versions will be given special price considerations.

Model I versions of ST80™ for use with THE CONNECTION™ will be available in special versions designed for use with this device.

TRADE MARKS:

ST80 & VERIPROMPT - Lance Micklus, Inc.
TRSDOS - Radio Shack, a Tandy Company
NEWDOS - Apparat, Inc.
VTOS - Virtual Technology, Inc.
CP/M - Digital Research, Inc.
THE CONNECTION - The Peripheral People

ST80 SUPPORT POLICY

The Small Business Systems Group, Inc., is standing fully behind the ST80 product line: Full customer support free for 30 days after purchase of any ST80 package; six months of upgrades and product announcements for a small mailing and handling charge. This is for all users who have signed and returned the program product agreement included with every order. We have a 24 hour-a-day, seven day-a-week mail and message computer (FORUM-80) for ST80 users. New product announcements, notices of updates and additional supporting programs are available and on-line on our FORUM-80 system.

ST80 is alive and consistently being improved by Lance Micklus with new releases averaging one update per quarter. SBSG, together with Lance, is concerned and interested in your comments on our offerings--both pro and con. FORUM-80 provides everyone the opportunity to call and comment on our products. We are regular callers to the FORUM and answer all questions and requests for information.

ST80 from SBSG is not only a package, it's a subscription to successful communication.

In summary, our names are on our products, we're PROUD of our offering and we're ready to provide you with benefits of our experience.

"SBSG can get you there!"

FORUM-80 <617> 692-3973

Change SY90 III serial II (handwritten)

Hit 'S' to Stop, 'P' to Pause

```
10 CLS:CLEAR1000:DIME$(35):DIMF$(35):DIMD(10):D(1)=80:D(2)=64:D(3)=112:D(4)=96:D(5)=14:D(6)=126:D(7)=176:D(8)=180
15 PRINT"This program is a public domain program by Tom Vande-Stouwe":PRINT"of B.T. Enterprises, and CONNECTION-83 BBS (516) 589-583
G":PRINT:PRINT 1
20 PRINT"This program will remove the serial number from your":PRINT"STBOIII/CMD (tm) Version 2.2 program and replace it with":PRINT
"a message of your choice. This program will also create an"
30 PRINT"auto log-on for some BBS system which use polling as an auto":PRINT"logon feature":PRINT:PRINT"Please enter <1> for custom
log-on, <2> for custom message"
40 I$=INKEY$:IFI$=""THEN40
50 IFI$="1"THEN300
60 IFI$="2"THEN400
70 GOTO40
200 STOP
300 CLS:E$(1)="."
310 PRINT"Your log-on may have 26 characters in it. Please use the":PRINT"following format:First last:town state: JOHN SMITH:ANYTO
WN NY"
315 FORX=2TO25:PRINT@704+X,"-"::NEXT
320 FORX=2TO25:GOTO330
325 FORX=1TO25:GOTO330
330 I$=INKE /$::IFI$=""THEN330
335 IFASC(I$)=8THENX=X-1:PRINT@704+X,"-"::GOTO330
336 IFI$=CHR$(13)THENFORZ=XTO29:E$(2)=CHR$(32):NEXTZ:GOTO375
340 IFASC(I$)<32THEN330
350 IFASC(I$)>90THENPRINT@560,"UPPER CASE ONLY PLEASE"::GOTO330
360 PRINT@704+X,I$::E$(X)=I$
370 NEXT
375 E$(30)=CHR$(15)
380 GOTO500
400 CLS:PRINT"This section will allow you to enter any message you like":PRINT"to be sent when the host calls your program by sendin
g":PRINT"3 control A's (CHR$(1)). The limit is 29 characters."
410 FORX=1TO25:PRINT@704+X,"-"::
420 NEXT
430 GOTO325
500 FORX=1TO29
510 C=ASC(E$(X))
520 C=C-31
530 D=INT((C-1)/6)+1
540 F=C-((D-1)*6)
550 FORI=1TOF:READG:NEXT
560 RESTORE:E=D(D)+G
570 F$(X)=CHR$(E)
580 NEXTX
585 F$(30)=CHR$(15)
590 FORX=1TO30:T$=T$+F$(X):NEXTX
800 OPEN"R",1,"STBOIII/CMD"
810 GOSUB1000
815 GET1,10
820 LSET ID$=T$
830 PUT1,10
840 CLOSE
850 END
1000 F:ELD1,217ASEDU$,30ASID$:RETURN
2000 DATA5,7,1,3,13,15,9,11
20000 I$=INKEY$:IFI$=""THEN20000ELSEFRINTASC(I$):GOTO2000
```